

The apparatus shall be a wildland fire apparatus designed specifically for use in the wildland interface zone or as an initial attack rescue pumper. The body shall be constructed specifically to withstand the stresses of off-road wildland firefighting. Additionally, the apparatus shall meet all requirements as described in NFPA 1906, Standard for Wildland Fire Apparatus. Specific details of the apparatus shall be as described below.

### **Body Construction**

The entire apparatus body is to a welded structure of '304' stainless steel using '304' stainless steel TIG welded with stainless '308' filler rod and/or MIG welded with '308' stainless steel wire using a tri-mix gas shield. All body and compartment components must be CNC machine punched and assembled on fixtures.

Each stainless steel apparatus body side shall be of a one (1) piece design and shall be CNC manufactured from one continuous sheet of 12 gauge '304' stainless steel. No seams shall be allowed in the body sides. Weld points used to attach the compartments shall not be exposed at the exterior of the body. Welding to the body exterior surface shall be limited only to the front and rear panels, which are welded directly to the one (1) piece side panel.

The body must contour around the rear wheels in such a fashion to give the body a pleasing appearance. Adequate clearance must be provided between the tires and the liners for tire chains per NFPA requirements. Additionally, the wheel well shall be expanded and shaped to minimize the chance of rocks becoming trapped between the tire and wheel well during offroad use.

The rear of the body sides shall contour upward from the rear wheels to the rear bumper to allow a minimum angle of departure of 30 degrees.

### **Stainless Steel Rub Rails**

The bottom edge of the entire body shall have a stainless steel rub rail installed to give the body a pleasing appearance. The rub rails shall be mounted to the body panels, and the fasteners shall not be exposed to the exterior of the rub rails. The ends of the rub rails shall be welded and polished to match the "satin" finish on the remainder of the rub rail. Rails that use plastic or rubber inserts shall not be acceptable due to the possibility of their loss or deterioration in the off-road environment.

### **Stainless Steel Wheel Well Liner w/ Rubber Fenderette**

The wheel well on the body shall be lined on each side to a depth of 24 inches with stainless steel sheet material. The wheel well liner shall be bolted in place with stainless steel bolts and washers to allow it to be removed if needed for maintenance purposes. The outer edge of the wheel well shall have an extruded rubber fenderette. The fenderette

shall be flexible to withstand contact with brush and other items in the offroad environment. Additionally, the fenderette shall be attached with stainless steel bolts and washers on the outside to allow it to be removed and replaced if needed without removing the wheel well liner. The fenderette shall be shaped and contoured to present a pleasing appearance with no gaps or wrinkles.

### **Heavy Duty Body / Water Tank Frame Construction**

The entire body assembly shall be designed to provide maximum strength and durability in the off-road environment. To that end, only structural steel members shall be acceptable in the construction of the frame. Steel must be used due to its high strength and its lack of fatigue failure under repetitive stress. Frames made from aluminum, bent sheet material, or thin gauge steel shall not be acceptable.

The main body frame shall be constructed as a ladder style frame. The main sides shall be 2 inch by 4 inch by 1/4-inch box or 3 inch by 6 inch by 1/4-inch box sections that run the full length of the body. The crossmembers shall be 2 inch by 4 inch by 1/4-inch box sections spaced to meet the tank manufacturer's requirements for tank support. Additional 2 inch by 3/16-inch channels shall be positioned to provide extra support around the sump. The entire ladder frame shall be constructed on full-length sills with a wall thickness of 1/4 inch in order to set the height of the body with good wheel well clearance while maintaining the lowest possible center of gravity on the water tank. Two full lengths 3-inch by 3-inch angle sections shall frame the chassis frame to prevent side-to-side movement.

The tank shall have full support around the bottom perimeter. The outer sides shall be framed in with 3-inch by 3-inch angle sections to hold the tank steady and prevent movement.

Lower side compartment support shall consist of a minimum of three (3) 3/16-inch thick, 3-inch vertical channels laid on edge and welded to the main tank frame. All compartments shall be supported by 3 inch by 3 inch angle sections welded to vertical channels or the main tank supports. Attachment to the chassis frame or to the sides of the compartment for support is not acceptable.

The rear deck shall be supported by 2 inch by 4 inch by 1/4-inch thick box sections extending off the main frame. This shall provide a strong, stable platform for the pump and pump motor. The frame shall be fully capable of absorbing all vibrations caused by the pump or movement of the apparatus.

A 1-inch by 3-inch polypropylene sill cushion will be positioned between the body frame and the chassis frame. The sills must be retained in position by attaching them to the metal frame with lag bolts. Tabs shall be provided to prevent movement of the sills when the vehicle is in motion.

### **Springer Mounting**

The apparatus body frame is to be mounted to the chassis frame via a minimum of four springer mount assemblies. Each springer mount assembly is to be constructed from 1/4 inch flat steel. Each assembly shall consist of two parts. One part shall be welded to the body frame, and the clear other part shall be bolted to the chassis frame via grade 8 bolts. The two parts shall interlock to form a single assembly that prevents forward, aft, and sideways movement of the body while the apparatus is in motion. The two sections shall further be connected via two 7/8-inch grade 8 bolts centered in 6-inch springs. These springs shall allow vertical movement of the body to prevent any "twist" from being transferred from the chassis frame into the body frame. The springs shall be carefully sized to allow movement during chassis twist while preventing the body from lifting while traversing side slopes or moving around curves. The springs shall allow a minimum lift of 1 inch of vertical movement at all corners of the body.

Rigid mounting of the chassis frame to the tank frame will result in undue stress on the body and is therefore unacceptable.

The body manufacturer shall test each body type for the operation of the springer mounting system. The test shall consist of elevating the tires on opposite corners of the apparatus to a height of 9 inches while keeping the remaining two tires on level ground. The springer mounting system shall prevent stress within the body. The test shall be considered to be passed if each of the doors on the body can be opened freely and if there are no gaps between the tank frame and the water tank. Since this apparatus is designed for the strenuous offroad environment, only a springer mounting system is considered acceptable, and proof of the successful completion of this test must be provided upon request.

### **Six Side Compartments w/ Flush Doors**

Two (2) lower front compartments constructed of 14 gauge 4F satin finish 304 stainless steel shall be provided, one (1) each side in front of the rear wheels. The lower front compartments shall have approximate inside dimensions of 48 inches wide by 19-1/2 inches tall by 26 inches deep. The compartment door cutout dimensions shall be 48 inches wide by 21-1/2 inches tall. The clear door opening shall be 46 inches wide by 19-1/2 inches tall. The clear depth with the door shut shall be approximately 25 inches. Access panels shall be provided in the back of each compartment to provide access to the forward springer mount assemblies. The panels shall be covered and sealed with removable panels designed to prevent dust entry into the compartment. The passenger side (right side) lower front compartment shall contain the door for access to the electrical compartment.

Two (2) upper front compartments constructed of 14 gauge 4F satin finish 304 stainless steel shall be provided, one (1) each side in front the rear wheels. The upper front compartments shall have approximate inside dimensions of 36 inches wide by 22 inches tall by 17 inches deep. The compartment door cutout dimensions shall be 36 inches wide by 23 inches tall. The clear door opening shall be 34 inches wide by 21 inches tall. The

clear depth with the door shut shall be approximately 16 inches.

Two (2) compartments constructed of 14 gauge 4F satin finish 304 stainless steel shall be provided, one (1) each side above the rear wheels. The passenger side (right side) compartment shall have approximate inside dimensions of 60 inches wide by 31 inches tall by 17 inches deep. The compartment door cutout dimensions shall be 60 inches wide by 33 inches tall. The door opening shall be 58 inches wide by 31 inches tall. The driver's side (left side) compartment shall have approximate inside dimensions of 50-1/2 inches wide by 31 inches tall by 17 inches deep. The compartment door cutout dimensions shall be 50-1/2 inches wide by 33 inches tall. The clear door opening shall be 48-1/2 inches wide by 31 inches tall. The driver's side compartment shall be shortened to provide space for the spare tire compartment. For each compartment, the clear depth with the door shut shall be approximately 16 inches.

All clear dimensions shall include clearance for doorjamb and headers. The floor, rear wall and top of each compartment shall be of one continuous piece of 14-gauge stainless steel. The compartment bends shall then be attached to 12 gauge stainless steel end panels. Splicing of the compartments in this area will not be acceptable. The one piece compartment end panels shall be CNC machine punched, then welded to the one piece main body using a MIG/TIG procedure with a tri-mix gas shield.

The sides of the compartments at the welds must not have weld markings or stitching showing. All interior weld marks and weld discoloration shall be polished or removed to present a clean, smooth finish. The interior of the compartments shall remain 4F "satin" stainless steel for superior stain resistance and ease of cleaning. Paint or other materials used to cover the inside of the compartments shall not be acceptable. In addition, the interior of the compartment must be free from interference caused by the body frame or other structural supports used in the manufacture of the body. The compartments must be completely open on the interior except for door hardware and items used to support trays, shelving, and other equipment storage.

### **Sealed Compartments**

Each of the side compartments shall be sealed to prevent the entry of dust and other foreign matter during offroad use. There shall be no compartment venting that would allow the entry of dust while the apparatus is in motion. The sweep out design of the compartments shall allow the draining of any trapped moisture.

### **Flush Door Construction**

The side compartment door construction shall be of 12 gauge 304L stainless steel and be FLUSH with the outside of the body. The doors shall be of a rigid design with all edges and corners fully welded, enclosed, ground and bent back into the compartment with three (3) 90 degree angled surfaces giving the door edges a channel effect for a sturdy and rigid design. The doors must have a 16 gauge 4F satin finish stainless steel reinforcing pan tig welded to the inner door of 1-inch depth. The pan shall be foam insulated to assure sound deadness and provide additional rigidity to the door. Painting of

the inner door pan shall not be acceptable. Doors thicker than 1-inch shall not be acceptable due to the loss of usable space inside the compartment.

The compartment doors will pivot on a full-length stainless steel continuous hinge with a pin diameter of not less than 3/16 inch. The door handle latch assembly must be a Hanson removable large locking "D" ring assembly of stainless steel with bent "D" ring configuration for easy hand insertion. Door locking mechanisms shall be automotive design. This shall allow for easy opening and closing simply by slamming the door shut. Latches which require the turning of the latch to have them shut are not permitted. The locking mechanism shall be mounted to the inner pan, and shall not be exposed to interior of cabinet. Each door shall be keyed the same, and a minimum of two (2) keys shall be provided with the delivery of the unit.

Each compartment will be fitted with a closed cell rubber seal designed to provide an air cell for sealing pressure between the door assembly and compartment. Flat foam seals will not be acceptable. Additionally, mirror finish polished trim angles shall be installed around the perimeter of each door (except on the hinge side) as well as around the complete perimeter of the door opening. This trim shall attractively finish out the door to present a distinct appearance and prevent chipping of any paint when storing and removing equipment.

The vertically hinged compartment doors will have Cleveland spring door closures. The door closure will ride on a spring-loaded rod to allow opening and closing of the door easily without any operator action to release the spring.

The horizontally hinged compartment doors will have gas cylinders to hold the doors in both the open and shut position.

**Open Interior in DS Lower Front Compt (w/Stainless Unistrut)**

The interior of the driver's side (left side) lower front compartment shall be a 4F "Satin" finish stainless steel to provide a pleasing appearance. The compartment shall be fully open without any obstructions caused by body framework, lighting mounts, or other structural features. The floor of the compartment shall be covered with black Turtle Tile brand plastic dry decking. This type of decking shall allow drainage while still allowing ventilation to stored equipment.

Four (4) Unistrut, model TB90039, stainless steel channels shall be provided and mounted in the driver's side lower front compartment for the attachment of optional adjustable shelving and optional adjustable slide-out trays. Each Unistrut stainless steel channel shall have dimensions of 1-5/8 inches X 13/16 inches X 14 gauge. Attachment of the channels to the compartment walls shall be with #10-24 X 3/8 inch flat head countersink stainless steel machine screws. The channels shall be approximately 8 inches long for vertical adjustment of the optional adjustable accessories in the compartment. Two (2) of the unistruts on opposite corners of the compartment shall have holes punched every 4 inches to allow the insertion of a retaining pin under the optional shelving. The retaining pin shall prevent any shelving from sliding downward while the vehicle is in

motion on rough terrain.

#### **Adjustable Shelf in DS Lower Front Compartment**

One (1) adjustable 12 gauge 4F satin finish stainless steel shelf shall be provided and mounted in the driver's side lower front compartment. The stainless steel shelf shall have dimensions of 46 inches wide by 22 inches deep with a 1-inch lip turned up on the front and sides and a 1 inch lip turned down on the rear edge. The forward edge of the shelf shall have a black vinyl trim lock installed on the exposed edge. Attachment of the shelf to the four (4) stainless steel Unistrut channels located on the compartment walls shall be with four (4) Unistrut, model TB900, stainless steel 3/8-16NC clamping nuts with short springs.

#### **Floor Mounted Slideout Tray in PS Lower Front Compt**

The interior of the passenger side (right side) lower front compartment shall be a 4F "Satin" finish stainless steel to provide a pleasing appearance. The compartment shall be fully open without any obstructions caused by body framework, lighting mounts, or other structural features.

One (1) 12 gauge 4F "satin" finish stainless steel, 250 pound rated, floor mounted slide-out tray shall be provided and mounted in the passenger side lower front compartment. The stainless steel tray shall have approximate dimensions of 42 inches wide by 22 inches deep with a 3 inch lip turned up on all edges. The forward edge of the tray shall have a black vinyl trim lock installed on the exposed edge. The tray shall lock in the extended or retracted position via an insertable pin located at the side of the tray.

#### **Open Interior in DS Upper Front Compt (w/Stainless Unistrut)**

The interior of the driver's side (left side) upper front compartment shall be a 4F "Satin" finish stainless steel to provide a pleasing appearance. The compartment shall be fully open without any obstructions caused by body framework, lighting mounts, or other structural features. The floor of the compartment shall be covered with black Turtle Tile brand plastic dry decking. This type of decking shall allow drainage while still allowing ventilation to stored equipment.

Four (4) Unistrut, model TB90039, stainless steel channels shall be provided and mounted in the driver's side upper front compartment for the attachment of optional adjustable shelving. Each Unistrut stainless steel channel shall have dimensions of 1-5/8 inches X 13/16 inches X 14 gauge. Attachment of the channels to the compartment walls shall be with #10-24 X 3/8 inch flat head countersink stainless steel machine screws. The channels shall be approximately 10-5/8 inches long for vertical adjustment of the optional adjustable accessories in the compartment. Two (2) of the unistruts on opposite corners of the compartment shall have holes punched every 4 inches to allow the insertion of a retaining pin under the optional shelving. The retaining pin shall prevent any shelving from sliding downward while the vehicle is in motion on rough terrain.

### **Adjustable Shelf in DS Upper Front Compartment**

One (1) adjustable 12-gauge 4F satin finish stainless steel shelf shall be provided and mounted in the driver's side upper front compartment. The stainless steel shelf shall have dimensions of 34 inches wide by 13 inches deep with a 1-inch lip turned up on the front and sides and a 1 inch lip turned down on the rear edge. The forward edge of the shelf shall have a black vinyl trim lock installed on the exposed edge. Attachment of the shelf to the four (4) stainless steel Unistrut channels located on the compartment walls shall be with four (4) Unistrut, model TB900, stainless steel 3/8-16NC clamping nuts with short springs.

### **Open Interior in PS Upper Front Compt (w/Stainless Unistrut)**

The interior of the passenger side (right side) upper front compartment shall be a 4F "Satin" finish stainless steel to provide a pleasing appearance. The compartment shall be fully open without any obstructions caused by body framework, lighting mounts, or other structural features. The floor of the compartment shall be covered with black Turtle Tile brand plastic dry decking. This type of decking shall allow drainage while still allowing ventilation to stored equipment.

Four (4) Unistrut, model TB90039, stainless steel channels shall be provided and mounted in the passenger side upper front compartment for the attachment of optional adjustable shelving. Each Unistrut stainless steel channel shall have dimensions of 1-5/8 inches X 13/16 inches X 14 gauge. Attachment of the channels to the compartment walls shall be with #10-24 X 3/8 inch flat head countersink stainless steel machine screws. The channels shall be approximately 10-5/8 inches long for vertical adjustment of the optional adjustable accessories in the compartment. Two (2) of the unistruts on opposite corners of the compartment shall have holes punched every 4 inches to allow the insertion of a retaining pin under the optional shelving. The retaining pin shall prevent any shelving from sliding downward while the vehicle is in motion on rough terrain.

### **Open Interior in PS Upper Front Compt (w/Stainless Unistrut)**

The interior of the passenger side (right side) upper front compartment shall be a 4F "Satin" finish stainless steel to provide a pleasing appearance. The compartment shall be fully open without any obstructions caused by body framework, lighting mounts, or other structural features. The floor of the compartment shall be covered with black Turtle Tile brand plastic dry decking. This type of decking shall allow drainage while still allowing ventilation to stored equipment.

Four (4) Unistrut, model TB90039, stainless steel channels shall be provided and mounted in the passenger side upper front compartment for the attachment of optional adjustable shelving. Each Unistrut stainless steel channel shall have dimensions of 1-5/8 inches X 13/16 inches X 14 gauge. Attachment of the channels to the compartment walls shall be with #10-24 X 3/8 inch flat head countersink stainless steel machine screws. The channels shall be approximately 10-5/8 inches long for vertical adjustment of the optional adjustable accessories in the compartment. Two (2) of the unistruts on opposite corners of the compartment shall have holes punched every 4 inches to allow the insertion of a

retaining pin under the optional shelving. The retaining pin shall prevent any shelving from sliding downward while the vehicle is in motion on rough terrain.

**Adjustable Shelf in PS Upper Front Compartment**

One (1) adjustable 12-gauge 4F satin finish stainless steel shelf shall be provided and mounted in the passenger side upper front compartment. The stainless steel shelf shall have dimensions of 34 inches wide by 13 inches deep with a 1-inch lip turned up on the front and sides and a 1 inch lip turned down on the rear edge. The forward edge of the shelf shall have a black vinyl trim lock installed on the exposed edge. Attachment of the shelf to the four (4) stainless steel Unistrut channels located on the compartment walls shall be with four (4) Unistrut, model TB900, stainless steel 3/8-16NC clamping nuts with short springs.

**Open Interior in DS High Side Compt (w/ Stainless Unistrut)**

The interior of the driver's side (left side) high side compartment shall be a 4F "Satin" finish stainless steel to provide a pleasing appearance. The compartment shall be fully open without any obstructions caused by body framework, lighting mounts, or other structural features. The floor of the compartment shall be covered with black Turtle Tile brand plastic dry decking. This type of decking shall allow drainage while still allowing ventilation to stored equipment.

Four (4) Unistrut, model TB90039, stainless steel channels shall be provided and mounted in the driver's side high side compartment for the attachment of optional adjustable shelving. Each Unistrut stainless steel channel shall have dimensions of 1-5/8 inches X 13/16 inches X 14 gauge. Attachment of the channels to the compartment walls shall be with #10-24 X 3/8 inch flat head countersink stainless steel machine screws. The channels shall be approximately 19-5/8 inches long for vertical adjustment of the optional adjustable accessories in the compartment. Two (2) of the unistruts on opposite corners of the compartment shall have holes punched every 4 inches to allow the insertion of a retaining pin under the optional shelving. The retaining pin shall prevent any shelving from sliding downward while the vehicle is in motion on rough terrain.

**Adjustable Shelf in DS High Side Compartment**

One (1) adjustable 12-gauge 4F satin finish stainless steel shelf shall be provided and mounted in the driver's side high side compartment. The stainless steel shelf shall have dimensions of 48-1/2 inches wide by 13 inches deep with a 1-inch lip turned up on the front and sides and a 1 inch lip turned down on the rear edge. The forward edge of the shelf shall have a black vinyl trim lock installed on the exposed edge. Attachment of the shelf to the four (4) stainless steel Unistrut channels located on the compartment walls shall be with four (4) Unistrut, model TB900, stainless steel 3/8-16NC clamping nuts with short springs.

**Open Interior in PS High Side Compt (w/ Stainless Unistrut)**

The interior of the passenger side (right side) high side compartment shall be a 4F "Satin" finish stainless steel to provide a pleasing appearance. The compartment shall be fully open without any obstructions caused by body framework, lighting mounts, or other structural features. The floor of the compartment shall be covered with black Turtle Tile brand plastic dry decking. This type of decking shall allow drainage while still allowing ventilation to stored equipment.

Four (4) Unistrut, model TB90039, stainless steel channels shall be provided and mounted in the passenger side high side compartment for the attachment of optional adjustable shelving. Each Unistrut stainless steel channel shall have dimensions of 1-5/8 inches X 13/16 inches X 14 gauge. Attachment of the channels to the compartment walls shall be with #10-24 X 3/8 inch flat head countersink stainless steel machine screws. The channels shall be approximately 19-5/8 inches long for vertical adjustment of the optional adjustable accessories in the compartment. Two (2) of the unistruts on opposite corners of the compartment shall have holes punched every 4 inches to allow the insertion of a retaining pin under the optional shelving. The retaining pin shall prevent any shelving from sliding downward while the vehicle is in motion on rough terrain.

#### **Adjustable Shelf in PS High Side Compartment**

One (1) adjustable 12-gauge 4F satin finish stainless steel shelf shall be provided and mounted in the passenger side high side compartment. The stainless steel shelf shall have dimensions of 58 inches wide by 13 inches deep with a 1-inch lip turned up on the front and sides and a 1 inch lip turned down on the rear edge. The forward edge of the shelf shall have a black vinyl trim lock installed on the exposed edge. Attachment of the shelf to the four (4) stainless steel Unistrut channels located on the compartment walls shall be with four (4) Unistrut, model TB900, stainless steel 3/8-16NC clamping nuts with short springs.

#### **Strip Lighting in All Compartments w/ Screw Clamps**

Strip lighting shall be installed in the side and top compartments (except fuel storage compartments). On the side compartments the lighting shall start at the bottom of the compartment and extend up the sides and across the top in order to provide lighting around the perimeter of the compartment. On the top compartments the lighting shall be installed around three sides of the compartment opening.

It shall be mounted using screw clamps instead of just channel with two sided adhesive strips.

The purpose of the strip lighting shall be to provide even lighting throughout the compartment while minimizing shadows and dark zones caused by shelving or equipment stored in the compartment.

#### **Hosereel Mounting Area**

An area at the forward side of the body above the upper front compartments on both sides

of the body will be provided for recessed mounting of the hose reels. This area will have approximate dimensions of 35 inches wide by 8 inches tall by 23 inches deep. The floor and the walls will be treadplate. Adequate channel and angle support will be provided below the floor to support and provide mounting structure for the hose reels. This recessed area shall allow the reels to be mounted at a height that is more convenient for pulling and rewinding hose.

#### **Rear Platform with Spare Tire Compartment**

The rear of the apparatus shall be formed as a platform. The platform shall have approximate dimensions of 79 inches wide by 29 inches deep. This platform shall serve as a mounting location for the pump, pump engine, pump panel, and associated plumbing. There shall be a walkway to the left of the pump that provides access to the top of the body. The entire platform (including the vertical walls) shall be constructed from 14-gauge stainless steel treadplate.

To the left of the platform shall be a spare tire storage compartment. The spare tire storage compartment shall be constructed from 12-gauge stainless steel sheet and 14 gauge stainless steel treadplate. The outer edge of the compartment shall be constructed from a double wall consisting of the body side and a second 12-gauge wall on the inside of the compartment. The inside edge of the compartment shall be made from 14 gauge treadplate and shall form the left side of the rear platform. Hatshapes shall be provided on the inside of the spare tire compartment. These hatshapes shall have a dual function. First, they shall provide extra strength to the walls of the compartment. Second, they shall function to hold the spare tire in the vertical position while preventing side-to-side motion of the tire. The floor of the compartment shall be crowned to prevent the tire from rolling when unsecured. A nylon web-restraining strap shall be provided over the top of the tire to hold it from moving fore and aft while the apparatus is in motion. Drain holes shall be provided in the bottom of the compartment. The approximate dimensions of the compartment shall be approximately 16-1/2 inches wide by 48 inches tall by 45 inches deep (with the door shut). The clear door opening shall be approximately 14 inches wide by 44 inches tall. The hatshapes shall be sized to allow approximately 12-1/2 inches for the tire width.

The door of the spare tire compartment shall be constructed from 12-gauge stainless steel with a 16 gauge inner pan and a stainless steel vertical hinge. The outer side of the door shall have a treadplate panel to allow it to cosmetically match the rest of the unit. The door shall be equipped with a polished locking paddle latch and an automotive style slam latch.

#### **Top of Body**

The top of the apparatus will be clad full length with tread plate. It will be rolled and double folded back under to give a smooth edge along the outside edge. The folded edge will extend a minimum of 3/4 inch past the sides and break at a 30-degree downward angle. The corners will be cut at a 45-degree angle, welded and polished. There will be no sharp edges using this procedure.

Additionally, structural support and mounting bolts will be provided in the for optional storage boxes at the front and right side of the apparatus.

#### **Hard Hose Storage Compartment**

A hard hose compartment constructed of 14 gauge stainless steel treadplate will be supplied on the driver side top to hold four 2 inch by 8 foot long sections of hard suction hose with rocker lug fittings. The compartment will have a full-length shelf installed in the vertical center of the compartment to allow the hose to be carried with two sections on the bottom and two sections on the shelf. The compartment will have a vertically hinged overlap door with pushbutton latch at the rear for access. The approximate size of this compartment will be 10 inches wide by 10 inches tall by 98 inches long.

#### **Recessed Storage Box on Top of Water Tank**

One storage box shall be provided at the top of the body as an integral part of the water tank. The storage box shall be constructed from black polypropylene and shall have dimensions of 56 inches long by 14 inches wide by 18-1/2 inches deep. The box shall have an overlap style lid also constructed from black polypropylene. A drain shall be provided in the bottom of the box that allows any moisture to drain through the tank to the ground. This shall allow the box to be used for items such as foam storage pails.

#### **Polypropylene Storage Box on Top Front of Body**

One storage box shall be provided at the top front of the body. The storage box shall be constructed from black polypropylene and shall have dimensions of 26 inches long by 34 inches wide by 20 inches deep. The box shall have an overlap style lid also constructed from black polypropylene. The box shall be bolted to the understructure at the front of the body directly aft of the cab guard. The box shall be hinged at the front and shall have two butterfly style latches to hold it shut.

#### **Polypropylene Storage Box on Top Right Side of Body**

One storage box shall be provided at the top right side of the body. The storage box shall be constructed from black polypropylene and shall have dimensions of 52 inches long by 16 inches wide by 12 inches deep. The box shall have an overlap style lid also constructed from black polypropylene. The box shall be bolted to the understructure at the side of the body directly outboard of the integral tank storage box. The box shall be hinged to the outside and shall have a butterfly style latch on each end to hold it shut.

#### **Front Panel Cladding**

The front panel of the apparatus shall be constructed from 12-gauge stainless steel sheet. The panel will be painted to match the rest of the body. The outer 16 inches of the front panel shall be clad with stainless steel treadplate. The cladding will be rolled and double folded back to give a smooth edge along the outside edge. The folded edge will extend a minimum of 3/4 inch past the sides and break at a 30-degree downward angle. The

corners will be cut at a 45 degree angle, welded and polished. There will be no sharp edges using this procedure. This will provide protection for the front corners from impact from brush and tree limbs.

### **Rear Bumper Construction**

The rear bumper shall be constructed from 8 inch deep by 3 inch tall by 1/4 inch wall thickness heavy steel tubing. The bumper shall have 2 inch by 3-inch box section legs that extend through the rear panel and bolt directly to the chassis frame. The outer sides of the bumper shall have end pieces constructed from 1/4-inch thick steel plate cut to match the angle of departure of the vehicle. The entire top of the bumper shall be covered in an expanded metal grating to provide a skid resistant surface. This shall form an access step to the rear platform at the back of the body. The entire bumper shall be powder coated black prior to installation on the apparatus.

One (1) fold-down step shall be provided on the bumper on the left side. This step shall be installed on brackets welded to the bumper. These brackets shall be installed prior to the powder coating of the bumper. The step shall attach to these brackets via a removable aluminum rod. The step itself shall be constructed from aluminum barstock and an extruded aluminum step with nonskid stepping surface. The step shall angle away from the bumper when in the down position. When in the up position, the step shall be retained by an oblong slot that fits over the mounting rod.

One (1) four inch diameter round work light shall be recessed in the underside of the bumper. This step shall function as a ground light for climbing on and off the apparatus at the rear. The step shall turn on with the pump panel light switch.

### **Railings, Handrails, and Folding Steps**

Rails of 1-1/4 inch diameter stainless steel tubing will be mounted on each outer side of the top of the apparatus at a height of 12 inches above the body. The rails will extend forward to the hose reel area. The rail on the passenger side will extend back to the rear platform and form a frame to install a vented stainless steel guard in front of the pump engine radiator. The railing will be extended across the upper rear leaving an opening for climbing to the top.

The radiator of the pump engine shall be protected on the right side of the apparatus with a 14-gauge 4F stainless steel guard with CNC punched holes in a pattern to cover the height of the radiator. The guard shall run forward to within 2 inches of the body and have a one inch lip turned in on each end for rigidity. It shall be framed with the stainless steel tubing and welded to it.

A stainless steel crosslink guard will be installed at the front top of the apparatus body to protect the rear cab window. It will be framed with 1-1/4 inch diameter stainless steel tubing and be the height as the top of the cab. It will have supports which angle back and down to the top of the body. These supports will also be designed to provide mounting for the lightbar.

One (1) 30 inch long handrail shall be mounted vertically just to the left of the access step at the rear platform. The handrail shall be constructed from a single 1-1/4 inch diameter polished aluminum extrusion. Rubber inserts shall be fitted into grooves on each quadrant of the circumference to provide a superior slip resistant grabbing surface. The handrail shall be then mounted in smooth, polished aluminum mounting pedestals with rounded end caps. The pedestals shall be mounted on the stainless steel body on rubber mounting bases to prevent galvanic corrosion between dissimilar metals. Handrails constructed from bent tubing or handrails without a slip resistant surface shall not be acceptable.

Two (2) NFPA compliant fold down steps are to be mounted on the left side of the rear panel to provide easy access to the top of the apparatus. The steps shall be constructed from heavy duty cast aluminum with spring assisted folding hinges. The top of the steps shall have an integral diamond point skid resistant surface that allows water to flow off the step without forming ice in cold weather use. The steps shall be mounted with rubber mounting plates to prevent galvanic corrosion between dissimilar metals. The steps shall be staggered to facilitate the use of the three point climbing method advocated by OSHA and industrial safety organizations.

Skid resistant Turtle Tile brand dry decking shall be installed on the top of the body at the rear and between the tank storage compartment and fill towers to provide a safe walking area. It shall also be installed on the lower rear platform to the left of the pump and plumbing. The tile shall be designed to allow drainage of water, mud, and other fluids while still allowing a nonskid surface that provides slip resistance. The nonskid surface shall be embedded into the top of the tile.

### **Multiplexed Electrical System**

The electrical system will be fabricated in modules as is the apparatus. The body and chassis will be individually wired as independent modules and connected as a completed unit at the final assembly via waterproof electrical connectors located in the electrical compartment. All GXL/SXL wiring for the apparatus body will be within a temperature resistant harness rated at a minimum of 280 degrees. All wires in each harness must be color and function coded. Wiring will be run along structural rails and tied in a neat and orderly manner. Wiring passing through compartments shall be protected from tears, abrasions, and cuts caused by loose items moving in the compartment space.

A multiplexed management system for controlling the electrical systems devices shall be provided. The system shall be capable of performing load management functions, system monitoring and reporting, and be fully programmable. All electrical circuits, breakers and wiring will be rated at 125% of the maximum load being imposed.

A single battery system shall be installed consisting of matching batteries furnished by the chassis manufacturer and a master switch single "on" position switch supplied by the body builder. This switch shall mount separately or as a part of the master console. When in the off position, all electrical power to the apparatus shall be off. There shall be a green pilot light visible to the driver, which illuminates when the master switch is activated. The batteries shall be installed in an accessible location.

The electrical junction box for all apparatus connections, relays, circuit breakers, etc., will be located in the forward face of the passenger side lower front compartment. It shall be of stainless steel construction with a stainless steel hinged door that opens out and is retained in the closed position with a push-button style spring-loaded latch. It must be recessed into the wall of the cabinet and be designed so as not to protrude out into cabinet storage area when in the closed position. It must be sealed and weatherproof. All components in the compartment must have identification tags. The apparatus circuits requiring breaker protection shall utilize sealed relays and automatic reset circuit breakers mounted on integrated printed circuit boards with self-diagnostic lights.

The completed body shall be grounded to the chassis with a minimum "0" gauge wire with crimped and soldered lugs. The lug shall be bolted to the chassis after the removal of all paints, rust, etc. Additionally a minimum 3/4" braided ground strap shall be furnished between the body and chassis. The ground strap shall have soldered tabs on each end and attached to the chassis as above except that stainless steel star washers shall be used between the ground strap tab and bolt. After attachment, all ground connection points shall be sprayed (soaked) with non-hardening battery terminal sealer. A ground strap will also be installed from the pump engine to the apparatus body.

All circuits shall be protected with automatic reset circuit breakers. Fuses shall not be accepted. The main power lead to the body shall include manual reset circuit breakers.

The electrical panel will contain four (4) spare 20 amp circuits (no switches) with circuit breakers and relays. Two spare leads shall be wired for the cab and two for the body.

A low voltage alarm shall be provided in the cab and at the pump panel. It shall provide an audible and visual indication when the truck electrical system voltage drops below 11.8 volts.

#### **Dash Mounted Switch Console**

All accessory and emergency lighting will be controlled at a master electrical dash mounted panel in the cab. The panel of twelve (12) lighted rocker switches and four (4) indicator lights is to be heavy duty rated to service the maximum imposed electrical load and will be supplied by the body builder. The electrical panel will have back lighted identification plates on a non-glare panel face illuminated when the master switch and the dash light switch is "on". The panel is to have a red door ajar indicator light that flashes automatically when a cab or side compartment door is open. A TSD buzzer shall be furnished on the switch console that sounds a tone when the door ajar light is flashing and the parking brake is released. The function and layout of the twelve (12) switches and four (4) indicator lights are as follows with the first switch located at the far left of the panel.

1) Emergency Lights: Red backlit switch. Activates all emergency or hazard lights and light bar switch. (With emergency or hazard warning package options only)

- 2) Lightbar: Red backlit switch. Activates lightbar when emergency light switch is on.
- 3) Horn/Siren: Red backlit switch illuminates in siren mode. Activates siren control head. (With emergency warning package option only)
- 4) Radio: Amber backlit switch. Activates power to the radios (20 amp breaker, no wiring needed to hook up radios)
- 5) Offroad Lights: Amber backlit switch. (With offroad light option)
- 6) Left Flood: Amber backlit switch. Activates the left side swivel floodlight when the body master switch is on.
- 7) Right Flood: Amber backlit switch. Activates the right side swivel floodlight when the body master switch is on.
- 8) Rear Flood: Amber backlit switch. Activates the rear panel floodlights when the body master switch is on.
- 9) Rear Spots: Amber backlit switch. Activates the rear swivel spotlights when the body master switch is on.
- 10) Pump Master: Amber backlit switch. Activates the pump electrical system.
- 11) Left Hose Reel: White momentary switch. Activates the left hose reel rewind when the body master switch is on.
- 12) Battery On: Green indicator light. Illuminates when the master battery switch is on.
- 13) Door Ajar: Red indicator light. Flashes when a cab or compartment door is open.
- 14) Pump Running: Amber indicator light. Illuminates when the pump engine is running.
- 15) Right Hose Reel: White momentary switch. Activates the right hose reel rewind when the body master switch is on.
- 16) Volt Alarm: Red indicator light. Activates when voltage drops below 11.8 volts.

#### **NFPA 1906 Electrical System Testing**

Electrical system tests shall be performed in accordance with NFPA 1906 recommendations. These include a Reserve Capacity Test, Alternator Performance Test at Idle, Alternator Performance Test at Full Load and a Low Voltage Alarm Test. At the time of delivery, documentation of these tests shall be provided along with a written load analysis.

#### **Emergency Warning Light Package**

The apparatus shall be equipped with a warning light package that meets or exceeds all requirements of NFPA 1906 "Wildland Fire Apparatus" and the requirements for intermediate emergency vehicles given in SAE J2498 "Minimum Performance of the Warning Light System Used on Emergency Vehicles."

### **52" Lightbar**

The front and front side zones shall be covered by one (1) 52-inch long lightbar mounted high on the apparatus. The lightbar shall have three rotators and four V mirrors. The lenses shall be red/clear/red. This center section of the lightbar shall be wired so that it turns off when the parking brake is set to meet the NFPA requirements for blocking mode.

### **Red Flashers on Front**

The front zone shall be covered by two (2) halogen lighthoods with red lenses. These lights shall have approximate dimensions of 7 inches long by 3 inches tall and shall be mounted on the front of the chassis cab.

### **Red Side Lights**

Each of the side zones shall be covered by two (2) halogen lighthoods with red lenses. These lights shall have approximate dimensions of 7 inches long by 3 inches tall and shall be mounted in 7EFLANGE bezels. One of the lights shall be mounted at the rear of the body, and the other light shall be mounted on the front corner of the chassis for use as an intersection style light. (Four lights total)

### **Rear Flashers**

The rear zone shall be covered by two (2) halogen lighthoods with red lenses. These lights shall have approximate dimensions of 7 inches long by 3 inches tall and shall be mounted on the rear panel.

### **Red Rotators on Upper Rear**

The rear and rear side zones shall be covered by two (2) halogen rotators. The (2) rotators shall be positioned at the rear corners of the apparatus and have 360-degree rotation. The rotators shall have red lenses.

### **Siren Control Head**

One (1) siren control head shall be mounted in the chassis cab in a location convenient to the driver. The siren control head shall have electronic air horn, public address mode, wired noise canceling microphone and contain electronic siren tones of wail, yelp and Hi-Lo. The siren control head shall be backlit for easy night operation.

### **100 Watt Speaker Behind Bumper**

One (1) 100-watt siren speaker will be mounted behind the bumper and connected to the siren head. The speaker shall be mounted in a protected location (such as inside the chassis frame rails), and shall be protected by a 14-gauge stainless steel guard to protect it from damage due to branches or brush.

#### **"Do Not Move Apparatus" Light**

A red "Do Not Move Apparatus" light shall be located in the cab and shall flash automatically when a lighted compartment door is open, a cab door is open, or another hazard exists. The light shall be incorporated into the switch panel.

#### **Backup Alarm**

One (1) backup alarm shall be installed and have a minimum of 87 dB rating. It shall be energized automatically when the chassis is placed into reverse gear.

#### **ICC and Work Lighting**

One license plate bracket constructed of stainless steel shall be provided at the rear of the apparatus. One (1) light shall be provided to illuminate the license plate.

Two (2) clearance lights shall be mounted on the upper rear corners, one on each side of the body. The clearance lights shall be LED lights with polished trim ring attached with button head stainless steel screws. The clearance lights shall be located according to ICC regulations.

Three (3) round ICC clearance lights with rubber shock-resistant mounting grommets will be provided and located at the rear of the apparatus recessed into the rear panel. These lights shall be LED lights.

Two (2) lights shall be mounted on the front panel, one on each side of the body. These lights shall be mounted in stainless steel guards to protect them from impact from brush. These lights shall function as ground lights for the cab door and shall be activated when the cab doors are opened.

One (1) 4 inch diameter round work lights shall be mounted in the underside of the rear bumper adjacent to the folddown step. The light shall face downward and shall be mounted so that the shine towards the ground. The light shall be mounted in a shock-resistant rubber grommet and shall be recessed into the bumper to protect them from brush. This light shall provide ground lighting at the rear and shall be activated with the pump panel light switch.

#### **Flood/Spot Light Combination**

Two (2) sealed beam incandescent flood lamps with toggle switch and a mounting bracket which has full 360 degree rotation both in a horizontal and vertical axis shall be

mounted at the forward corners of the apparatus body just aft of the hoses. Additionally, two (2) sealed beam halogen spot lamps with toggle switch and a mounting bracket which has full 360-degree rotation both in a horizontal and vertical axis shall be mounted top at the rear corners of the apparatus body. These lights shall also have a switch at the master console. Each of these lights shall be mounted under the protective side rail to prevent damage from low hanging tree limbs while in off-road use.

#### **Tail Lights / Backup Lights**

Two (2) 4 inch round shock mount backlights will be provided mounted one each side of the valve control panel on the rear of the apparatus. The back-up lights will automatically energize when the chassis transmission is placed in reverse gear. These lights will be also activate with a switch on the master console in the cab so they can be used as rear flood lights.

Two (2) red 7 inch by 3 inch stop / tail lights will be provided at the rear of the apparatus. The low intensity filaments will be wired so that they come on as the taillights, and the high intensity filaments will come on when the brake pedal is pressed.

Two (2) amber 7 inch by 3- inch arrow turn signal lights will be provided at the rear of the apparatus. The turn signal lights will be wired to chassis system so that they activate with the turn signal switch on the steering column. These lights shall be in compliance with federal standards.

Each of the lights shall be sealed from the environment. The backup lights shall be easily replaceable in the event of a failure. Each light shall be constructed from high impact-resistant plastic to prevent damage from gravel or other debris.

#### **Apparatus Body Paint**

All body metal surfaces are to be sanded, cleaned, etched and primed, according to the BASF Glasurit 22 line process for stainless steel painting. The paint manufacturer shall warrant the paint for LIFETIME. Individuals who have been CERTIFIED by the paint manufacturer must apply the paint and the paint manufacturer must CERTIFY the painting facility. Proof of certification must be provided in the bid specifications submitted. The apparatus body is to be painted one (1) color to match the ordered chassis paint color with BASF Glasurit polyurethane paint.

Color code: \_\_\_\_\_

#### **Apparatus Chassis Paint**

The chassis shall be painted by the chassis manufacturer according to the chassis manufacturer's factory standards. The body builder shall not repaint the chassis.

#### **White Reflective 1"-3"-1" Stripe on Body Side**

The body shall have a 1-inch – 3- inch - 1 inch three strand white reflective stripe positioned on the sides of the body and cab. A 4- inch stripe shall be positioned at the front of the apparatus on the wings of the body. The rear stripe shall be a 2 inch white reflective stripe across the entire width of the body to meet the area requirements of striping per NFPA. All stripes are per NFPA standards and ASTM D 4965, Standard Specifications for Retro-reflective Sheeting for Traffic Control. All striping shall be according to the user's layout.

#### **Touch Up Paint**

A two (2) ounce container with an applicator brush of touch-up paint shall be supplied for each color of the finished apparatus body color paint at the time of delivery or pick up of the apparatus.

#### **Extra Fasteners**

A bag of miscellaneous stainless steel fasteners used in the construction of the apparatus shall be provided at the time of delivery or pick up of the apparatus.

#### **One Pair of Wheel Chocks Mounted Under Fwd Compt**

One (1) pair of NFPA compliant folding wheel chocks with horizontal mounting brackets shall be provided and mounted one (1) per side under the lower forward compartment. The wheel chocks shall be positioned as close to the wheel well as possible to prevent interference with the apparatus breakover angle.

#### **Pump w/ Diesel Engine**

The pump shall be a fixed mounted pump located on the rear platform. The pump shall be rated as a medium pressure pump per NFPA 1906. The pump shall be mounted on the rear platform using rubber vibration isolators and locknuts.

The pump shall be driven by a minimum 34 horsepower diesel fueled motor. The engine shall be a four-cycle, four cylinder diesel with an active precleaner installed on the air filter to prevent the entry of embers and soot. The engine will have a minimum cylinder displacement of 1335 cubic centimeters.

An electric fuel pump shall be furnished and installed under the cab for the pump engine. The pump engine pickup shall have a separate port on the fuel tank. It shall be higher than that for the vehicle engine fuel system to preclude the pump leaving insufficient fuel in the tank for movement of the vehicle.

The pump shall be equipped with a 12 volt, 1.2-kilowatt gear driven electric starter that is controlled from the operator's panel. The starter and the associated 12-volt, 360 watt alternator shall be hardwired to the chassis electrical system via a TSD electronic disconnect controlled from the main switch box in the cab. An amber light shall be located on the main switch box in the cab that indicates when the pump is running.

### **Stainless Steel Pump Panel**

A stainless steel pump operator's panel will be installed on the rear of the apparatus to the aft of the pump. The panel will be approximately 4 inches deep and will be capable of being reached while standing on the ground at the rear of the apparatus. The panel shall be constructed from 12- gauge 4F "satin" finish stainless steel to present a pleasing appearance. The panel shall be illuminated by two (1) lights under a hood formed from the top of the panel. The top of the panel shall have a 1 inch lip on the backside to provide protection for the gauges and wiring. The top shall be held in place with hex head bolts to allow it to be removed for maintenance purposes. The lights shall have a quick disconnect so that they can be removed with the panel top easily during maintenance.

The pump engine controls shall be located in standard style pump engine panel mounted as a unit on the left side of the pump operator's panel. The engine panel will contain the following controls and gauges:

(1) Electronic Tachometer (2) Hourmeter (3) Oil pressure gauge (4) Water temperature gauge (5) Voltmeter (6) Glow plug light (7) Oil pressure override switch (8) Engine on-off-start and glow plug switch (9) Throttle

A second, smaller trim plate to the right of the engine control panel shall contain the pump panel light switch, a low water pressure override switch, an five light water level indicator, and a 2-1/2 inch diameter pressure gauge. The gauge shall have a pressure diaphragm assembly made of 316 stainless steel and shall be plumbed to the master drain for freeze protection.

The right side of the pump panel shall contain the foam system controls, the primer button, and the master drain handle. The master drain shall drain residual water from all ports of the rear plumbing simultaneously.

The water level tank-sensing probe shall be of a chemical resistant PVC with a stainless steel sensing port.

A placard will be mounted on the rear of the apparatus that indicates the proper pump starting sequence.

A performance tag will be mounted on the pump panel that indicates the maximum GPM, maximum PSI, the GPM at 100 PSI and the GPM at 350 PSI.

All gauges, controls, switches, discharges and suction will be labeled with tags.

All knobs on all valve handles will be loc-tited in place to prevent them from coming loose during off-road operation.

### **Electrically Driven Oilless Primer**

The priming pump will be a positive displacement vane type, electrically driven, and conform to NFPA standards. One priming control will both open the priming valve and

start the priming motor. The control will be a push-button style located on the operator's control panel and shall be sealed from the environment. The primer is to be oilless and require no lubrication.

### **Stainless Steel Plumbing**

All plumbing shall be threaded/welded schedule 40 304L stainless steel or high-pressure flexible hose. Appropriate couplings shall be used where appropriate to allow easier disassembly for maintenance. The stainless welds shall be cleaned and polished.

### **Pump Discharges**

All main discharge plumbing will be 2-inch diameter reduced at the valves to the appropriate size. The discharge plumbing will also have a 2 inch four bolt flange above the rear deck area for ease of service of the pump and plumbing. A 2 inch MNPT priming port with a chrome cap and stainless steel #12 single jack chain will be installed on the top on the main discharge plumbing.

A Hobbs pressure switch will be installed in the discharge plumbing. The switch will be wired into the engine power circuit to provide an automatic shutdown for the pump when the discharge pressure falls below 15 PSI.

One (1) 1-1/2 inch discharge will be supplied on the rear panel of the body below the pump panel. The discharge will have an fire service valve controlled by a Class One handle located immediately next to the discharge. The discharge will terminate with a 1-1/2 inch FNPT by 1-1/2 inch MNST chrome adapter with cap and stainless steel #12 single jack chain.

Two (2) 1-1/2 inch discharges will be supplied on the front of the apparatus body, one (1) per side. Each discharge will have a fire service (locally controlled) valve with a chrome cap and stainless steel #12 single jack chain.

Two (2) polished aluminum booster reels will be mounted on the forward side of the apparatus, one per side above the forward side compartment in the hose reel mounting area. The reels will be ordered so that one is a left hand model and one is a right hand model. Each booster reel is to have the following features: 2/3 hp motor, top wind 1 inch NPSH riser outlet, and closed rollers with steel bushings mounted to the outside with aluminum brackets. The hose reels will each be controlled by a fire service (locally controlled) valve mounted on the front of the body. The connection between the valve and the reel will be with high-pressure 1-inch hydraulic hose. Each reel will have a rewind switch installed on the body side directly below the front of the reel to allow a fire fighter to hold the booster hose while pushing the rewind button. Additionally, there will be a separate switch on the cab console for the driver to control the rewind of each reel individually while the apparatus is in pump-and-roll operations. The reels will be mounted as far forward as possible to allow for removal of rewind motor. The wires will be sealed where they enter the motor.

The discharge plumbing on the front of the body will have an extra 2-inch T installed and plugged for optional future installation of a 1-1/2 discharge at the top front of the body.

### **1" Ground Sweep Discharges on Each Side of Body**

A 1" ground sweep shall be provided on each side of the discharge manifold at the front of the body (two sweeps total). The outlets shall come down from the left and right side and be controlled with an electric valve and manual valve (for back up). The electric valves shall be controlled from the cab. The nozzle shall have a cone shaped pattern and be adjustable.

### **Foam System**

The apparatus shall be equipped with an electronic, fully automatic, variable speed, direct injection, and discharge side foam proportioning system. The system shall be capable of handling Class A foam concentrate. The foam proportioning system shall be based on direct measurement of water flows and remain consistent within the specified flows and pressures. The system shall be equipped with a control module, which is installed on the pump operator's panel. Incorporated within the motor driver shall be a microprocessor which receives input from the system flowmeter, while also monitoring foam concentrate pump output, comparing values to ensure that the operator preset proportional amount of foam concentrate is injected into the discharge side of the fire pump.

A paddlewheel type flowmeter shall be installed in the discharges specified to be "foam capable".

The control module shall enable the pump operator to activate the system and select the proportioning rate from 0.1% to 1.0%. This shall allow easy operation of the foam system with a on/off switch and a meter valve to control the foam concentration.

A 12-volt electric motor driven, positive displacement plunger pump shall be provided. The pump capacity shall be 1.0 gpm at 200 psi with a maximum operating pressure up to 400 psi. This shall allow the pump to support up to 200 gpm of water at a proportioning rate of 0.5%. The motor shall receive signals from the control module and power the motor in a variable speed duty cycle to ensure that the correct proportion of concentrate is injected into the water stream. The motor and foam pump shall be located in an enclosed, vented compartment on the rear pump platform with access panels for maintenance.

A full flow check valve shall be provided in the discharge piping to prevent foam contamination of the fire pump and water tank. A 5 psi opening pressure check valve shall be provided in the concentrate line.

### **Pump Suctions**

The main suction plumbing coming into the pump will have a 2-inch strainer. The strainer will have a screw-off cap to allow easy cleaning of the filter element in the field. The plumbing will also have a 4 bolt quick disconnect flange and one victaulic coupling

between the strainer and the pump for ease of service on the pump. The suction plumbing will be 2 inch running to the inlet of the pump.

One (1) 2-inch rear suction will be supplied on the rear panel below the pump panel. The suction will have a fire service valve controlled by a Class One T handle next to the fitting. The suction will terminate with a 2 inch FNPT by 2 inch MNPT chrome adapter with rocker lug cap and stainless steel #12 single jack chain.

One (1) 2-inch suction will be supplied on the drivers side front of the body. The suction will have a fire service (locally controlled) valve with a rocker lug chrome cap and stainless steel #12 single jack chain.

#### **Tank-to-Pump**

One (1) 2-inch tank to pump line will be supplied. The line will have an fire service valve controlled by a Class One T handle on the rear body below the pump panel.

#### **Tank Fill and Pump Bypass Cooling Line**

One (1) 1-1/2 inch tank fill line will be supplied. The line will have a fire service (locally controlled) valve. The valve will be accessible from the operators' position.

One (1) 1/4-inch bypass cooling line will be provided. This line will provide sufficient cooling for the pump under all operations while minimizing the pressure loss in the line. This line will plumbed from the discharge side of the pump to the tank fill piping at the tank. The line will also include a check valve to prevent water from draining from the tank into the pump when it is drained.

#### **Direct Tank Fill**

One (1) 2-1/2 inch direct suction and fill line will be provided on the rear body below the pump panel. The line will have a fire service valve controlled by a Class One T handle. The plumbing will terminate through the rear panel with a 2-1/2 inch FNPT by 2-1/2 inch MNST chrome adapter, rocker lug cap, and stainless steel #12 single jack chain.

#### **Pump Testing**

One (1) Manufacturers Certified Pump Test shall be performed at the manufacturers on site testing facility. The certification shall give the rated discharge, pressure and the speed of the engine as per NFPA requirements. Results of the test shall be provided in writing to the department upon acceptance of the completed apparatus.

#### **US Forest Service Valve Labeling System**

Each valve will be labeled as to its function immediately adjacent to the valve control. The valves will be labeled in accordance with the US Forest Service valve numbering system in common use with off-road firefighting agencies. That numbering system is as follows:

No. 1 Tank-to-Pump

No. 2 Pump-to-Tank

No. 3 1-1/2 Discharge

No. 4 Hosereel

No. 8 Overboard Draft (for 2 inch pump inlets)

#### **Pump Seal Kit w/ Gaskets and Tools**

The apparatus shall include a pump seal kit with gasket and tools. The kit shall include one replacement mechanical seal for the pump, a impeller puller, two (2) replacement gaskets, and all the wrenches and pliers necessary to complete the change out of the pump seal.

#### **850-Gallon Polypropylene Tank w/ 20 Gallon Foam Cell**

The tank shall have a rated capacity of 850 U.S. gallons. The tank manufacturer shall mark the tank and furnish notice that indicates proof of warranty. The purpose of the notice is to inform department personnel who store, stock, or use the tank that the tank is under warranty. The tank shall be constructed of Polyprene sheet stock. This material shall be non-corrosive stress relieved thermo-plastic, black in color, and U.V. stabilized for maximum protection. The tank shall be completely independent of the body and compartments. All exterior tank joints shall be extrusion welded and/or contain the BENT EDGE technology for maximum strength and integrity. The top of the tank shall be fitted with removable lifting eyes designed with a 3 to 1 safety factor. The baffles shall be constructed of Polyprene material. All partitions shall be equipped with vent and air holes to permit the movement of air and water between compartments. The tank shall have a combination vent and manual fill tower. The vent shall also serve as an overflow and shall have a minimum I.D. of 4 inches. The overflow will discharge excess spillage behind the rear axle by use of internal piping within the tank. The overflow shall have a plastic tab to prevent the entry of a fill hose into the overflow during overhead fill operations. A removable plastic screen shall be located in the fill tower around the overflow. A 10 inch square fill tower with hinged lid for the water tank shall be located at the forward part of the apparatus body. The entire tank will be mounted on a 1/4 inch 60 rubber sheet attached to the bottom of the tank between the tank and the tank frame.

The water tank is to be equipped with one primary tank floor sump. There will be three (3) 2-1/2 inch openings in the bottom of the sump (one for the direct fill, one for the tank-to-pump, and one for a clean out fitting). Two (2) secondary sumps located at the front and the rear of the floor of the tank for connection to the main sump. The secondary tank sumps will be designed and connected to the main sump to allow water to flow to the pump when the apparatus is on a 20% grade in any direction. The main sump will be equipped with an anti-swirl baffle plate.

The water tank shall have a clear plastic sight tube located at the back of the apparatus to provide a backup for the electronic water level indicator described elsewhere in these specifications.

### **20-Gallon Foam Cell**

The water tank will have an integral 20-gallon foam tank provided. The foam tank will meet all applicable NFPA standards. An easily seen, durable label or plate showing "foam fill" will be placed at or on the foam tank fill tower lid.

The foam tank will be built of copolymer plastic to provide maximum strength and chemical resistance. Sufficient baffles will be provided to control foam swash. The floor will be tapered to an outlet so the foam achieves a minimum of 90% to full tank drainage with minimum aeration during all operations on level ground. This also facilitates periodic flushing as may be needed.

The foam tank will be provided with a fill tower expansion area compartment (with 2% minimum volume). The fill tower will be equipped with a pressure vacuum vent device that does not come in contact with the foam liquid. A gasketed, latched lid and a removable plastic screen cover the fill tower.

The foam tank will be located at the rear of the truck and have a sight tube for determination of foam level.

### **Mini-Tank Level Indicator in Chassis Cab**

A mini-light tank level indicator shall be provided in the chassis cab.

### **Chassis Modifications**

Two (2) rear tow hooks will be provided and mounted to the chassis frame. The tow hooks shall be accessed at the rear of the apparatus from underneath the bumper at the rear angle-of-departure. Underride protection shall be provided to prevent interference with the angle of departure in accordance with federal regulations.

Two (2) mud flaps will be installed on rear of apparatus behind rear wheel so that they do not reach the tire when pushed forward. This will prevent the mudflap from being pinched between the tire and objects on the ground while the apparatus is in operation off-road. The mudflaps will have stainless steel dress strips installed on them to present a pleasing appearance.

The cab and chassis shall be undercoated using a commercially available process prior to the installation of the body as a corrosion preventative.

One (1) dual air horn shall be mounted inside the frame rail behind the front bumper. The air horns shall be controlled from a floor switch on the driver's and passenger's side.

A tag shall be provided in the cab that reads, "WARNING- The GVWR is 33,000 lbs for this vehicle, the maximum in service GVW shall not exceed 31,000 lbs."

One (1) Innovative Controls mini light tank level gauge shall be provided in the chassis cab.

A protective guard shall be provide at the front of the apparatus to provide protection for the ABS lines underneath the radiator.

The contractor will affix a permanent plate in the driver's compartment specifying the quantity and type of the following fluids used in the vehicle:

- A) Engine coolant
- B) Engine oil
- C) Chassis transmission fluid
- D) Power steering fluid
- E) Pump transmission lubrication fluid (if applicable)
- F) Rear Drive axle lubrication fluid
- G) Front drive axle lubrication fluid
- H) Transfer case lubrication fluid

An audible and visual low voltage warning alarm will be included in the cab.

An accident prevention sign that states the number of personnel the vehicle is designed to carry will be located in an area visible to the driver.

A placard will be installed in the cab indicated OAL, OAW (mirror to mirror), OAH in feet and inches (i.e. 9ft 6in) and empty weight.

A warning sign(s) stating "Occupants Must Be Seated And Belted When Apparatus Is In Motion" will be installed in the cab area where all occupants can see it. The letter height will be at least 1/4 inches.

One (1) "Final Stage Label" will be attached to the drivers side door jamb. The label will certify that the completed vehicle conforms to the federal motor vehicle safety standards, which have been previously fully certified by the incomplete vehicle manufacturer or by the intermediate vehicle manufacturer and have not been affected by the final-stage manufacturer.

The ignition key will be permanently attached to the chassis dash per NFPA codes.

One (1) Arrow light shall be provided in the engine compartment for illumination.

#### **All Wheel Drive Chassis**

The apparatus shall be built on a 4x4 chassis with a straight frame. The construction of the body frame shall be specially designed to fit this chassis.

#### **Extended Cab w/ Air Front and Rear Seats**

The cab shall be configured as an extended two-door cab with seating for up to four personnel. The driver's and passenger front seats shall each be hi back seats with air suspension. The two rear seats shall be facing each other and be hi-back seats with air suspension.

#### **Front Frame Extension**

A 20" integral front frame extension shall be provided.

#### **4x4 Suspension and Wheelbase**

The chassis shall have a 12,000 lbs front drive axle with a 12,000 lbs front leaf suspension with shocks. It shall also have a 21,000 lbs rear drive axle with a 23,500 lbs rear leaf suspension with shocks. The wheelbase shall be 193 inches with a 92-inch cab-to-axle measurement.

#### **300 Hp Engine**

The chassis shall be equipped with an electronic diesel engine. The engine shall be rated at a minimum 300 horsepower and 950 ft-lbs of torque.

#### **Block Heater**

An engine block heater with 110V outlet shall be provided.

#### **Automatic Transmission w/ Retarder**

The chassis shall be equipped with a five speed automatic transmission with an output retarder. The retarder shall be controlled automatically at 50% when the accelerator pedal is released and at 100% when the brake pedal is pressed. Switches shall be provided on the dash to disable the retarder if the driver desires. The transmission shall be controlled by a push button keypad with digital readout located to the right of the driver.

#### **Transfer Case**

The all wheel drive transfer case shall be a two-speed transfer case. This shall allow superior low speed capabilities for pump-and-roll operations, and good highway speeds while traveling long distances.

#### **Alternator and Batteries**

The chassis shall be provided with a 160 amp alternator and three maintenance free 12 volt batteries with 1950 CCA. The batteries shall be located adjacent to the driver's side cab door.

#### **Engine Equipment**

The engine shall be equipped with a 13.2 CFM compressor for the air brake system. It shall also have a dual element heavy-duty dual element air cleaner with an restriction gauge in the cab. The radiator shall be a welded, down flow, 940 square inch model with charging air cooler. The exhaust shall be a single horizontal muffler with a horizontal tailpipe mounted on the left side of the chassis frame rail.

#### **75-Gallon Fuel Tank**

The chassis shall be equipped with a 75-gallon diesel fuel tank located under the passenger side cab door. The tank shall be painted black in color and shall meet all federal regulations.

#### **Tilt and Telescoping Steering Wheel**

The steering wheel shall adjust to the driver's preferred position via a tilt and telescoping mechanism.

#### **Air Conditioning**

The chassis shall have air conditioning. The controls shall be located in the cab in a location convenient to both the driver and front seat passengers.

#### **AM/FM/Weatherband Radio**

The cab shall have a AM/FM stereo with weather band channel. It shall have electronic tuning and clock and shall include two (2) dual cone speakers.

#### **Tires**

The chassis tires shall be 1 11R22.5 Unisteel 16 ply tubeless. One (1) spare tire shall be provided with the chassis.

#### **Air Horn**

One air horn shall be mounted at the front of the unit along the frame rail.

#### **Front Brush Guard**

A mild steel brush guard shall be fabricated and mounted on the front bumper. This guard shall be able to fold down without removal to provide access to the hood and engine compartment. The design of the brush guard shall protect full width of the apparatus and not obstruct the headlight beam or the driver's vision. The brush guard shall be installed as to minimize movement and vibration. The guard shall also have a 48-inch wide mild steel crosslink covering to protect the cab and radiator from small branches and debris. The crosslink shall be recessed into the guard frame to prevent it from coming loose under impact. The brush guard shall be painted black in color.

Front tow hooks shall be accessible behind the front bumper.

**Multiplex Chassis**

Chassis and body will be Multiplex system to allow off site diagnostic capabilities.